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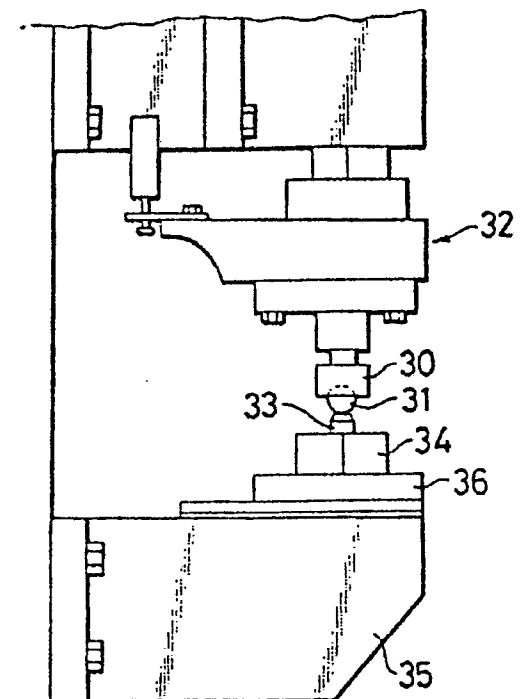
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54 **Method and apparatus for manufacturing piston rod.**

57 Piston rod manufacturing method wherein a ball (31) is fixed on end surface of a rod (33) through projection welding, and then the projection welding zone is tempered; the ball (31) is held in one electrode (30), while the rod (33) is held in another electrode (34), the end surface of the rod (33) is brought into contact with the ball (31), a current is then carried between the electrodes (30,34) to projection welding of the rod (33) and ball (31), the projection welding zone is cooled down under the state above, and then a current is carried between the electrodes (30,34) to tempering of the projection welding zone.

**FIG.4**



**EP 0 257 440 A3**



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y	DE-A-2 219 224 (VEB EDELSTAHLWERK) * Page 3, line 31 - page 4, line 9; figure 2 *	1, 3, 4, 6	B 23 K 11/32 B 23 K 11/14
Y,D	--- PATENT ABSTRACTS OF JAPAN, vol. 7, no. 240 (M-251)[1385], 25th October 1983; & JP-A-58 128 522 (TOKYO SHIBAURA DENKI K.K.) 01-08-1983 * Whole abstract *	1, 3, 4, 6	
A	--- DE-A-2 411 818 (M.A.N.) * Page 4, lines 18-23; page 6, line 10 - page 7, line 8; figure 3 *	1-7	
A	--- CH-A- 452 739 (T. WUPPERMAN GmbH) * Column 3, lines 8-18; column 4, lines 3-6 *	1, 3, 4, 6	
A,D	--- PATENT ABSTRACTS OF JAPAN, vol. 7, no. 237 (M-250)[1382], 21st October 1983; & JP-A-58 124 815 (TOKYO SHIBAURA DENKI K.K.) 25-07-1983 -----	1-7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 23 K F 16 C C 21 D B 23 P
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-08-1988	Examiner ALTING V. GEUSAU
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			